

WHAT IS CLAIMED IS:

1. A control apparatus for an automotive generator having a field coil comprising:

a switching device for turning on and off current supply to the field coil of the automotive generator;

a flywheel diode connected in parallel with the field coil;

a voltage detection circuit for outputting an instruction signal to turn on and off the switching device so that an output voltage of the automotive generator is regulated to a specified adjusted voltage; and

a drive circuit for driving the switching device, when the instruction signal instructing the switching device to turn on is input from the voltage detection circuit, by flowing a specific current to a control terminal of the switching device to raise a control terminal voltage until a terminal voltage of the field coil exceeds a specified value and applying a voltage higher than the output voltage of the automotive generator to the control terminal after the terminal voltage of the field coil exceeds the specified value.

2. The control apparatus as in claim 1, wherein the specific voltage compared with the terminal voltage of the field coil is greater than a reverse bias voltage of the flywheel diode.

3. The control apparatus as in claim 1, wherein the switching device is a MOS transistor having a gate terminal as

the control terminal.

4. The control apparatus as in claim 3, wherein the drive circuit includes:

a first current supply circuit for supplying the specific current to the gate terminal of the MOS transistor;

a charge pump circuit;

a second current supply circuit for supplying a current to the charge pump circuit; and

a signal circuit for intermittently operating the charge pump circuit,

wherein, when a conduction instruction signal is input from the voltage detection circuit, the drive circuit supplies the current from the first current supply circuit to the gate terminal until the terminal voltage of the field coil exceeds the specified value, and supplies an output voltage of the charge pump circuit to the gate voltage after the terminal voltage of the field coil exceeds the specified value.

5. A control apparatus for an automotive generator having a field coil comprising:

a switching device for turning on and off current supply to the field coil of the automotive generator;

a flywheel diode connected in parallel with the field coil;

a voltage detection circuit for outputting an instruction signal to turn on and off the switching device so

that an output voltage of the automotive generator is regulated to a specified adjusted voltage; and

a drive circuit for driving the switching device, when the instruction signal instructing the switching device to turn on is input from the voltage detection circuit, by applying a voltage higher than the output voltage of the automotive generator to a control terminal of the switching device,

wherein the drive circuit includes a charge pump circuit having an even number of capacitor stages, a current supply circuit for supplying a current to the charge pump circuit, a signal circuit for intermittently operating the charge pump circuit, and a diode connected in a forward direction from an input to output terminals of the charge pump circuit.

6. The control apparatus as in claim 5, wherein the switching device is a MOS transistor having a gate terminal as the control terminal.

7. The control apparatus as in claim 6, wherein the MOS transistor has a source connected to the field coil; and

the current supply circuit sets the current according to a source voltage of the MOS transistor.